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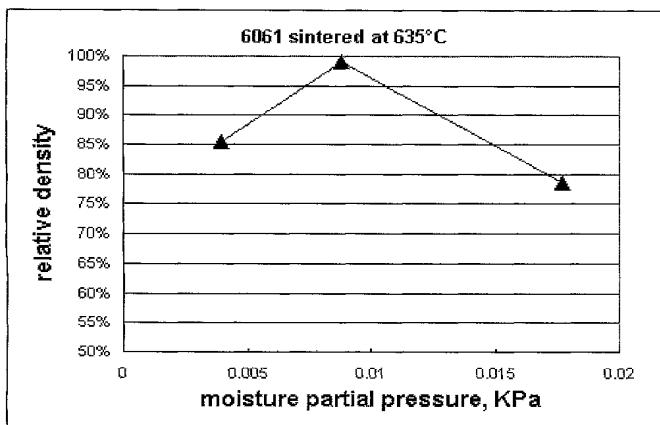
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(54) Title: PROCESSES FOR SINTERING ALUMINUM AND ALUMINUM ALLOY COMPONENTS



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(57) **Abstract:** Methods for sintering aluminum powder comprise providing aluminum powder and heating the aluminum powder in a nitrogen atmosphere containing a partial pressure of water vapor in the range of about 0.001 kPa to about 0.020 kPa to sinter the aluminum powder to a transverse rupture strength of at least about 13.8 MPa. The aluminum powder is not pressed together by a mechanical force that substantially deforms particles of said aluminum powder either prior to or during the step of heating. Articles comprising sintered aluminum powder. The sintered aluminum powder has a transverse rupture strength of at least about 13.8 MPa. The microstructure of the sintered aluminum powder contains no compositional concentration gradients indicative of the use of a sintering aid and no evidence of particle deformation having occurred by an application of a mechanical force prior to or during the sintering of the aluminum powder.